

PUB-NO: EP000120817A1  
DOCUMENT-IDENTIFIER: EP 120817 A1  
TITLE: Front seat assembly for motor vehicles.  
PUBN-DATE: October 3, 1984

INVENTOR-INFORMATION:

| NAME             | COUNTRY |
|------------------|---------|
| VITALE, CARLO    | N/A     |
| ACUTO, GIOVANNI  | N/A     |
| SBURLATI, LUIGI  | N/A     |
| TIRAPELLE, LUIGI | N/A     |

ASSIGNEE-INFORMATION:

| NAME          | COUNTRY |
|---------------|---------|
| FIAT AUTO SPA | IT      |

APPL-NO: EP84830069

APPL-DATE: March 13, 1984

PRIORITY-DATA: IT05311883U ( March 24, 1983) ,  
IT05401083U ( December 5,  
1983)

INT-CL (IPC): B60N001/04

EUR-CL (EPC): B60N002/12 ; B60N002/10

US-CL-CURRENT: 296/65.05, 296/65.09 , 297/325

ABSTRACT:

CHG DATE=19990617 STATUS=O> A seat (1) intended to be mounted on a pair of straight parallel guides (4) fixed to the floor (F) of the passenger compartment of the motor vehicle has associated front

support members (6, 7)  
which allow translational movement of the seat (1) along  
the guides (4) and  
forward rotation of the seat (1) about an axis  
perpendicular to the guides (4),  
and rear support members (8,9) resting on the guides (4)  
and raisable therefrom  
as a result of the said forward rotation of the seat (1).  
Between the seat (1)  
and the guides (4) are disengageable hook means (11, 17)  
which allow the seat  
(1) to be locked in a selectively adjustable normal  
position of use and, when  
disengaged, allow the seat to be brought to an advanced  
lowered position with a  
combined translational and forward rotational movement of  
the seat (1) itself.

12

**EUROPEAN PATENT APPLICATION**

21 Application number: 84830069.5

51 Int. Cl.<sup>3</sup>: B 60 N 1/04

22 Date of filing: 13.03.84

30 Priority: 24.03.83 IT 5311883 U  
05.12.83 IT 5401083 U

43 Date of publication of application:  
03.10.84 Bulletin 84/40

84 Designated Contracting States:  
DE FR GB IT SE

71 Applicant: FIAT AUTO S.p.A.  
Corso Giovanni Agnelli 200  
I-10135 Torino(IT)

72 Inventor: Vitale, Carlo  
Via Pietro Nenni 3  
I-10042 Nichelino (Torino)(IT)

72 Inventor: Acuto, Giovanni  
Via di Nanni 16/5  
I-10043 Orbassano (Torino)(IT)

72 Inventor: Sburlati, Luigi  
Corso Giambone 53  
I-10143 Torino(IT)

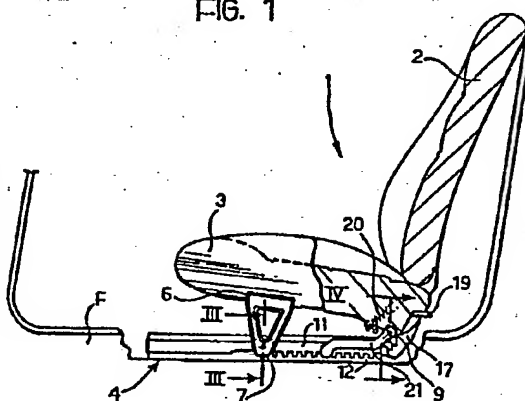
72 Inventor: Tirapelle, Luigi  
Via della Costituzione 52  
I-10036 Settimo Torinese (Torino)(IT)

74 Representative: Bosotti, Luciano et al,  
c/o Jacobacci-Casetta & Perani S.p.A. Via Alfieri, 17  
I-10121 Torino(IT)

54 Seat assembly for motor vehicles, particularly front seat assembly for motor cars.

57 A seat (1) intended to be mounted on a pair of straight parallel guides (4) fixed to the floor (F) of the passenger compartment of the motor vehicle has associated front support members (6, 7) which allow translational movement of the seat (1) along the guides (4) and forward rotation of the seat (1) about an axis perpendicular to the guides (4), and rear support members (8, 9) resting on the guides (4) and raisable therefrom as a result of the said forward rotation of the seat (1). Between the seat (1) and the guides (4) are disengageable hook means (11, 17) which allow the seat (1) to be locked in a selectively adjustable normal position of use and, when disengaged, allow the seat to be brought to an advanced lowered position with a combined translational and forward rotational movement of the seat (1) itself.

FIG. 1



EP 0 120 817 A1

- 1 -

Seat assembly for motor vehicles, particularly  
front seat assembly for motor cars

The present invention relates to motor vehicle seats and in particular to a seat assembly intended to be mounted on a pair of straight parallel guides fixed to the floor of the passenger compartment of the  
5 motor vehicle.

The object of the invention is to provide an adjustable and tippable seat, that is to say a seat which, starting from a normal position of use, can easily be adjusted in accordance with the anthropometric  
10 characteristics and habits of the occupant, and which can be brought into an advanced lowered position in which the movement of objects and persons into the region of the vehicle passenger compartment behind the seat itself is facilitated.  
15 One is thus considering a seat intended to be used for preference as the front seat of a motor car with two or three doors. A particular object of the invention is to provide a tippable seat whose normal position of use  
20 can be adjusted without significantly altering the setting of the seat.

According to the present invention this object is achieved by virtue of a seat assembly of the type specified above, characterised in that:  
25 - with the cushion of the seat there were associated front support members which allow the translational movement of the seat along the guides and forward rotation of the seat itself about an axis perpendicular to the guides and rear support members bearing on the guides  
30 and raisable from the guides by the effect of the said

- 2 -

forward rotation of the seat, and

- disengageable hook means interposed between the seat and the guides to allow the locking of the seat in a selectively adjustable normal position of use and, when disengaged, to allow the seat to be brought to an advanced lowered position with a combined translational and forward rotational movement of the seat itself.

Preferably the seat assembly according to the invention is further characterised in that it includes:

- two slides one on each side of the seat, slidably mounted on the guides and able to be locked the guides themselves in a selectively predetermined position,
  - disengageable locking means acting between the slides and the seat in order to lock the seat itself in a selectively adjustable normal position of use and acting on the slides, and
  - at least one pivotal connecting arm having one end hinged to the rear edge of the cushion and its opposite end hinged to one of the slides in a region which, in the said normal position of use, is interposed between the front support members and the rear support members for the seat, whereby, upon disengagement of the locking means, the seat may be slid on the guides towards the advanced position, while the connecting arm guides the rear edge of the cushion in a circular path, imparting a controlled forward rotational movement to the seat.
- A pair of pivotal arms is preferably used, each of the arms connecting a respective side of the cushion to one of the slides.

- 3 -

The invention will now be described purely by way of non-limiting example with reference to the appended drawings, in which:

Figure 1 is a vertical median sectional view of a  
5 first embodiment of a seat assembly for motor vehicles according to the invention, illustrated in a first position of use,

Figure 2 is a vertical median sectional view illustrating another position of use of the seat assembly of  
10 Figure 1,

Figure 3 is a section taken on the line III-III of Figure 1,

Figure 4 is a section taken on the line IV-IV of Figure 1,

15 Figure 5 is a partially sectioned vertical median view of a second embodiment of a seat assembly for motor vehicles according to the invention, illustrated in a position of use similar to that of Figure 1,

20 Figure 6 is a section on the line VI-VI of Figure 5, and

Figure 7 illustrates the seat assembly of Figure 5 in a position of use similar to that illustrated in Figure 2.

In the drawings there is shown generally indicated  
25 1 the front seat of a two-or three-door motor car (not illustrated).

- 4 -

The seat 1 can be seen to comprise a backrest 2 and a portion 3 defining the seating plane, which in the present description and in the following claims will be termed the "cushion".

- 5 Two channel-shaped straight guides 4 are fixed parallel to each other to the floor F of the passenger compartment of the motor car in correspondence with the sides of the seat.

- As is best seen in Figures 3 and 4, the guides 4  
10 face each other so that their longitudinal channels indicated 5 open into the space beneath the cushion 3 of the seat 1.

- Two feet or support legs 6 extend downwardly from the sides of the cushion 3 in positions intermediate  
15 the front edge and the rear edge of the cushion 3 itself. Each leg 6 carries a wheel or roller 7 at its free end, which, as seen in Figure 3, is slidable in the underlying guide 4.

- In correspondence with the ends of the rear edge  
20 of the cushion 3, the seat 1 has two further support legs 8 each of which carries a grooved roller or wheel 9 intended to rest and roll on the upper side of the corresponding guide 4.

- The arrangement described is such that the seat 1  
25 may effect a longitudinal translational movement on the guides 4. The shape of the legs 6 and 8 also allows the seat to effect a forward rotational movement about the common axis of rotation of the wheels 7 carried by the front legs 6 of the seat 1.  
30 As a result of this rotational movement, which takes place about an axis oriented perpendicular to the

- 5 -

guides 4, the rollers 9 are raised from the guides 4 and disengaged from them.

Two slides are indicated 11, each of which has a T-profile, the head of this profile being inserted in a respective one  
5 of the guides 4.

The slides 11 are thus able to slide longitudinally within the guides 4.

In its rear half, each of the guides 4 has a series of notches defining a toothed rack 12 on the lower edge of  
10 the channel 5.

In a manner widely known per se, each of the notches is intended to be engaged by a pin 13 carried by a pivotable element (crank) 14, pivoted on a further  
pin 15 fixed to the body of the corresponding  
15 slide 11. The crank 14 can be oriented by means of a control lever 16 (partially shown in Figure 4) which simultaneously controls the orientation of a similar crank 14 mounted on the slide 11 slidable in the guide 4 located on the  
20 other side of the seat 1.

The lever 16 is generally U-shaped and is disposed beneath the cushion 3 so that a passenger occupying the seat 1 may operate it easily by grasping its handle part which is located immediately beneath  
25 the front edge of the cushion 3.

The handle part of the lever 16, upon being raised, disengages the pins 13 from the notches of the toothed rack 12 of both guides 4, whereupon the slides 11 are movable



- 6 -

longitudinally within the guides 4. Subsequent lowering of the handle part of the lever 16 causes the pins 13 to engage in one of the notches of the rack 12 and consequently lock the slides 11 relative to the guides 4.

Two hook members 17 (one for each side of the seat) are intended to ensure firm connection between the rear edge of the cushion 3 and the slides 11 in the normal condition of use of the seat. The adaptation of the normal position of use of the seat 1 to the anthropometric characteristics and the driving or travelling habits of the passengers may thus be achieved by operation of the lever 16 (as described above and in a manner known per se) so as to vary the position in which the slides 11 are locked within the guides 4 as a result of the engagement of the pins 13 in the notches of the toothed rack 12.

The adjustment of the position of the seat 1 so far described involves only linear translational movement of the wheels 7 and the rollers 9 along the guides 4. The setting of the seat 1 thus remains the same whatever the position chosen by the passenger.

The hook members 17 are connected together by a shaft 18 which extends beneath the rear edge of the cushion 3. A handgrip or handle 19 allows the hook members 17 to be rotated against the return force exerted by at least one return spring 20 so as to disengage the rear edge of the cushion 3 from the slides 11.

- 7 -

Two pivotal arms, one for each side of the seat 1, are indicated 21 and each arm is hinged at one end to the rear edge of the cushion 3 (for example, in correspondence with the shaft 18). At its opposite end

5 each of the arms 21 is connected to a pin (possibly corresponding to the pin 15) carried by the respective slide 11 in a region which, in the normal position of use of the seat 1, is between the common axis of rotation of the wheels 7 and the rear edge

10 of the cushion 3.

The configuration described is such that, upon disengagement of the hook members 17 from the slides 11, the rear edge of the cushion 3 is no longer firmly connected to the slides 11. A thrust

15 exerted on the rear part of the backrest 2 thus causes, together the forward sliding of the seat, a simultaneous forward rotation of the seat itself about the common axis of rotation of the wheels 7, the position of which is

20 continuously variable as a result of the translational movement of the seat. The movement of the seat is controlled by the connecting arms 21 which rotate about their axis of hingeing to the slides 11 and guide the rear edge of the cushion 3 in a circular

25 path about this hinge axis.

As a result of this combined translational and rotational movement, the seat 1 is brought from the (adjustable) position of normal use illustrated in Figure 1 to the advanced lowered position

30 illustrated in Figure 2. Passengers occupying the rear seats of the motor car can thus get into or out of the car more easily.

As a result of the superposition of the rotation on the translational movement, the upper end of the backrest 2, in its movement from the normal position of use (Figure 1) to the lowered position (Figure 2), describes a longer path than the path described simultaneously by the end connected to the rear edge of the cushion 3. The amplitude of this latter path corresponds essentially to the length of the translational movement of the seat 1 on the guides 4.

The arrangement described thus allows the upper end of the backrest 2 to affect a greater lowering movement for the given translational movement, making a larger space available for the entry and exit of the rear seat passengers.

The connection of the seat 1 to the slides 11 by means of the arms 21 also prevents the seat 1 being completely free for sliding on the guides 4 even in event of imperfect closure or accidental disengagement of the hook members 17 which has obvious dangers for the passengers (both those occupying the front seats and the those occupying the rear seats) in the event of sharp deceleration of the motor vehicle.

Figures 5 to 7 illustrate a further possible embodiment of a seat assembly according to the invention in which identical reference numerals are used to indicate the elements already illustrated in Figures 1 to 4.

More particularly, in the embodiment of Figures 5 to 7, the cushion 3 includes, in a generally known manner,

- 9 -

a framework or structure constituted by profiled metal members between which extend connecting springs and also including foam padding fixed to the framework.

- 5 The framework of the cushion 3 includes two side members or sides 103 each of which has a lower portion projecting downwardly from each side 103, this lower portion having a slot 105 with a substantially straight course which extends into the front portion  
10 of the cushion 3.

Two profiled slides indicated 106 are slidable on a pair of straight guides 104 fixed to the floor F of the passenger compartment in an arrangement similar to that of the guides 4 of Figures 1 to 4.

- 15 The guides 104 have a generally channel profile open upwardly with two lateral flanges L projecting outwardly of the guide.

The slides 106 have a C profile with characteristics complementary to the profile of the guides 104.

- 20 Naturally it is possible to use guides 104 and slides 106 having complementary profiles different from those illustrated and in particular guides and slides having profiles similar to those of the guides 4 and the slides 11 described previously.

- 25 At the front end (that is to say the end facing the front edge of the cushion 3) of each slide 106 there is bolted (or alternatively projection welded) an approximately triangular bracket 107 which projects upwardly from the slide 106 and carries a horizontal-  
30 axis pin 108 at its upper end. The generally cylindrical

- 10 -

pin 108 engages in the groove 105 in the corresponding side 103 of the cushion 3.

In the assembled position, the pins 108 and the brackets 107 are thus aligned with each other along a horizontal axis perpendicular to the vertical planes in which the guides 104 and the slides 106 lie.

The brackets 107 and the pins 108 define front support legs or feet for the seat 1 located in correspondence with the sides 103 intermediate the front edge and the rear edge of the cushion 3.

At its rear edge, the cushion 3 has two further legs 109 which, in the normal position of use of the seat illustrated in Figure 5, rest on the slides 106 (and hence on the guides 104) in correspondence with the rear ends of these slides 106.

As is best seen in Figure 6, the support legs 109 are preferably constituted by shaped parts of a material with a high mechanical strength fixed to the rear ends of the sides 103 of the cushion 3.

Each support leg 109 has an insert 110 of anti-friction material having a bevelled edge 110a. As is seen in Figure 6, the bevelled edges 110a cooperate with the inner edge of the corresponding slide 106 so as to facilitate the correct lateral positioning of the seat 1 relative to the guides 104 on which it bears, the bevelled edges 110a of the rear legs 109 thus together defining a wedge configuration which can cooperate with the inner edges of the slides 106 to ensure the centering of the seat 1 relative to the guides 104.

By way of summary, the arrangement of parts described is such that the cushion 3, to which the backrest 2 is connected, is supported on the slides 106 by two front legs, constituted by the brackets 107, and by  
5 two rear legs constituted by the elements 109.

The slides 106 in their turn bear on the guides 104 relative to which the slides 106 can effect longitudinal sliding movement.

In a substantially similar manner to the arrangement  
10 described above with reference to the guides 4 and the slides 11, between each slide 106 and the corresponding guide 104 there are interposed disengageable locking means (for example, pins engaging the notches of a  
15 toothed rack) which allow the slides 106 to be locked relative to the guides 104 in a selectively predetermined longitudinal position. These locking means are operated by the control lever 16 (only partially visible in Figure 5) located beneath the cushion 3.

20 Again in this case, when the handle part of the lever 16 is lifted, the slides 106 are free to slide longitudinally on the guides 104. Lowering of the handle part of the lever 16 however causes the locking of the slides 106 relative  
25 to the guides 104.

Two hook members 112 substantially similar to the hook members 17 ensure a firm connection between the rear edge of the cushion 3 and the rear ends of the slides 106 in the normal condition of use of  
30 the seat (illustrated in Figure 5).

- 12 -

With the hooks 112 in the closed position, the cushion 3 (and consequently the seat 1) is firmly locked on the slides 106.

Under these conditions, the normal position of use  
5 of the seat may be adapted to the anthropometric characteristics and the driving or travelling habits of the passengers by operation of the lever 16 (as described above) so as to vary the position in which the slides 106 are locked on the guides 104 as a  
10 result of the engagement of the locking means interposed therebetween.

The adjustment of the position of the seat 1 effected in this manner involves solely a linear translation of the slides 106 on the guides 104  
15 and a corresponding relative sliding of the pins 108 within the slots 105. The seat 1 thus maintains its setting independently of the position chosen by the passenger.

The hook members 112 are connected together by a shaft  
20 113 which extends beneath the rear edge of the cushion 3 and are urged towards the position of engagement with the rear ends of the slides 106 by helical springs indicated 114.

A handgrip or handle (not illustrated) located on  
25 the side of the seat 1 facing outwardly of the motor car, allows the rotation of the hook members 112 to be effected against the return force exerted by the springs 114 so as to disengage the rear edge of the cushion 3 from the slides 106.

30 Two pivotal arms, one for each side of the seat 1, are indicated 115 and have a function which is similar

- 13 -

to that of the arms 21 described above. Each arm 115 is hinged at one end to the rear edge of the cushion 3 (for example adjacent the shaft 113). At its opposite end the arm is hinged to the corresponding slide 106 in a region which, in the normal position of use of the seat, is interposed between the horizontal axis of the pins 108 of the brackets 107 and the rear edge of the cushion 3.

When the hooks 112 are disengaged from the slides 106, the rear edge of the cushion 3 is no longer firmly connected to the slides 106 themselves. Under these conditions, even when the slides 106 are locked on the guides 104 as a result of the engagement of the locking means acting between these parts, a thrust exerted on the rear part of the backrest 2 causes the tipping of the seat 1 from the normal (adjustable) position of use illustrated in Figure 5, to the advanced lowered position illustrated in Figure 7. In the lowered position of the seat the entry (and exit) of passengers occupying the rear seats of the motor car is facilitated.

Again in the case of the embodiment of Figures 4 to 7, the tipping of the seat 1 is achieved by a combined translational and rotational movement.

The translational movement is determined by the sliding of the pins 108 within the slots 105 provided in the sides 103 of the seat 1. The rotational movement is, however, achieved by a rotation of the sides 103 about the pins 108. The rotational movement is thus achieved



instantaneously about the axis identified by the pins 108 themselves.

The translational-rotational movement of the seat is controlled by the connecting arms 115 which pivot  
5 about the hinge axis on the slide 106 and guide the rear edge of the cushion 3 in a circular path about this hinge axis.

As a result of the superposition of the rotational upon the translational movement, the upper end of the  
10 backrest 2, in its passage from the normal position of use (Figure 5) to the lowered position (Figure 7) describes a longer path than the path described simultaneously by the end of the backrest connected to the rear edge of the cushion 3. The amplitude  
15 of the latter path corresponds substantially to the length of the translational movement of the seat 1 relative to the guides 104, that is to say to the length of the slots 105.

Again in this case, the connection of the seat to the  
20 slides 106 achieved by means of the arms 115 prevents the seat from being completely free to slide relative to the guides 104 in the event of imperfect engagement or the accidental disengagement of the hook members 112 which have with obvious dangers for the passengers (both those  
25 occupying the front seats and those occupying the rear seats) in the event of sharp decelerations of the motor vehicle.

1. Seat assembly for motor vehicles  
intended for mounting on a pair of straight guides(4;104)  
which are parallel to each other and fixed to the floor  
(F) of the passenger compartment of the motor vehicle,  
5 characterised in that:  
- with the cushion (3) of the seat (1) there are associated  
front support members (6, 7; 107, 108) which allow  
translational movement of the seat (1) along the guides  
(4; 104) and forward rotation of the seat (1) itself  
10 about an axis perpendicular to the guides (4; 104), and  
rear support members (8,9; 109) bearing on the guides  
(4; 104) and raisable from the guides (4; 104) by the  
effect of the said forward rotation of the seat (1), and  
- disengageable hook means (11,17; 106, 112) interposed  
15 between the seat (1) and the guides (4; 104) to allow  
the locking of the seat (1) in a selectively adjustable  
normal position of use and, when disengaged, to allow  
the seat (1) to be brought to an advanced lowered position  
with a combined translational and forward rotational  
20 movement of the seat itself.
2. Seat assembly according to Claim 1, characterised in  
that it includes:  
- two slides (11; 106) one on each side of the seat (1),  
slidably mounted on the guides (4; 104) and able to be  
25 locked to the guides (4; 104) themselves in a selectively  
predetermined position,  
- disengageable locking means (17, 112) acting between  
the slides (11; 106) and the seat (1) in order to lock  
the seat (1) itself in a selectively adjustable normal  
30 position of use and acting on the slides (11; 106), and  
- at least one pivotal connecting arm (21;115) having  
one end hinged to the rear edge of the cushion (3) and  
its opposite end hinged to one of the slides (11; 106)  
in a region which, in the said normal position of use,  
35 is interposed between the front support members (6,7;107,108)  
and the said rear support members (8,9: 109) for the seat  
(1), whereby , upon disengagement of the locking means (17; 112),

the seat (1) may be slid on the guides (4; 104) towards the said advanced position, while the said connecting arm (21; 115) guides the rear edge of the cushion (3) in a circular path, imparting a controlled forward rotational movement to the seat (1).

3. Seat assembly according to Claim 2, characterised in that it includes a pair of pivotal arms (21; 115) each of which connect one side of the cushion (3) to one of the slides (11, 106).

10 4. Seat assembly according to any one of Claims 1 to 3, for mounting on substantially channel section guides which are open towards each other, characterised in that the front support member (6, 7) and the rear support members (8, 9) include rotary elements (7, 9) cooperating respectively with the channel and with the outer surface of the guides (4).

5. Seat assembly according to Claim 4, characterised in that at least some of the rotary elements are in the form of rollers or wheels (7, 9).

20 6. Seat assembly according to any one of Claims 1 to 3, characterised in that it includes:  
- two slides (106) one for each side of the seat (1) slidably mounted on the guides (104) and able to be locked to the guides (104) themselves in a selectively  
25 predetermined position, each of the slides (106) having, in correspondence with the front edge of the cushion, a bracket (107) with a pin part (108) defining, together with the pin part (108) of the bracket (107) of the other slide (106), the said rotational axis of the seat,

- disengageable locking means (112) acting between the slides (106) and the cushion (3) in order to lock the seat in a selectively adjustable normal position of use by modification of the locking position of the slides
- 5 (106) on the said guides (104), and
- a pair of shaped elements (103) each of which is located along a respective side of the cushion (3) of the seat (1) and has an elongate profiled part (105) which can cooperate with the pin part (108) of the bracket (107) of one
- 10 of the slides (106) in a configuration of use which allows :
- the guided sliding of the shaped element (103) relative to the pin part (108) along a path defined by the profiled part (105), and
- 15 - the rotation of the shaped element (103) about the common axis of rotation defined by the said pin parts (108).
- 7. Seat assembly according to Claim 6, characterised in that the shaped elements (103) are integral parts
- 20 of the structure of the cushion (3) of the seat.
- 8. Seat assembly according to Claim 6 or Claim 7, characterised in that each of the shaped elements (103) has a substantially straight slot (105) defining the said profiled part.
- 25 9. Seat assembly according to any one of Claims 6 to 8, characterised in that support legs (109) are associated with the shaped elements (103) in correspondence with the rear edge of the cushion (3) the legs being able to cooperate with the corresponding ends of the
- 30 said slides (106).

10. Seat assembly according to Claim 9, characterised  
in that the support legs (109) have bevelled edges (110a)  
for cooperating with the edges of the slides (106) in  
a generally wedge configuration in order to ensure the  
5 centering of the seat relative to the guides (104) in  
the normal position of use.



FIG. 3

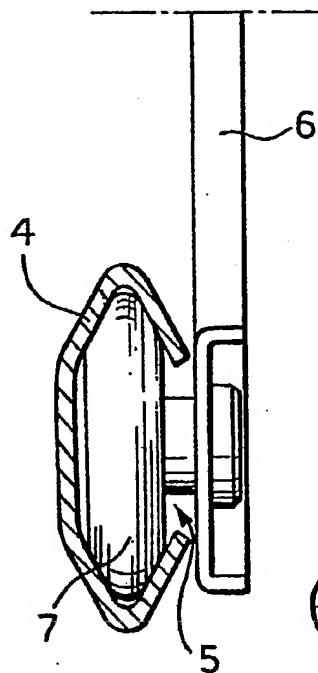
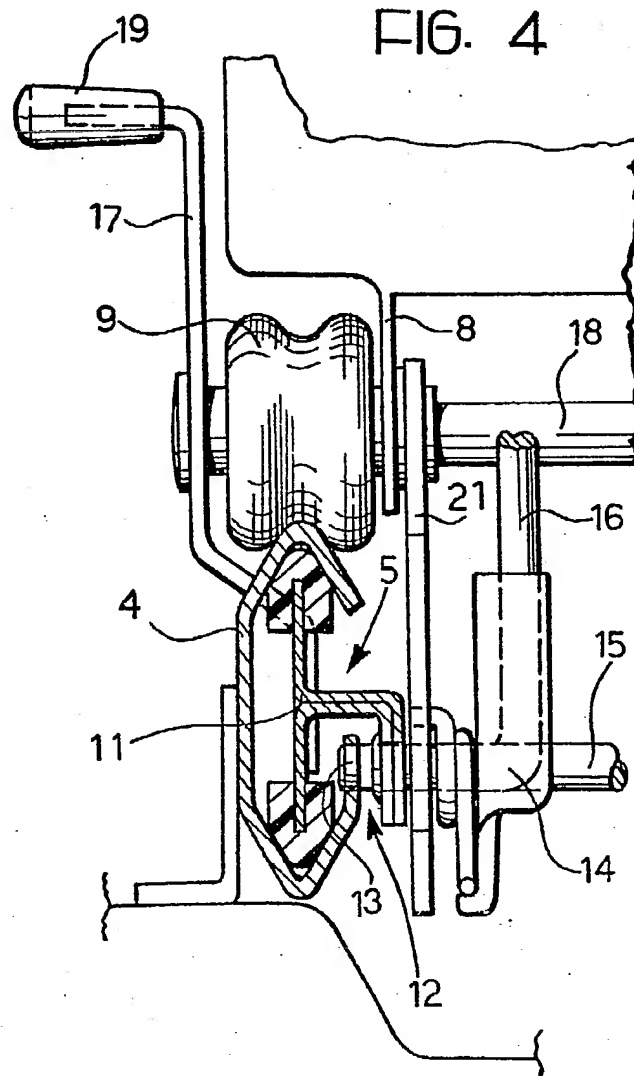


FIG. 4



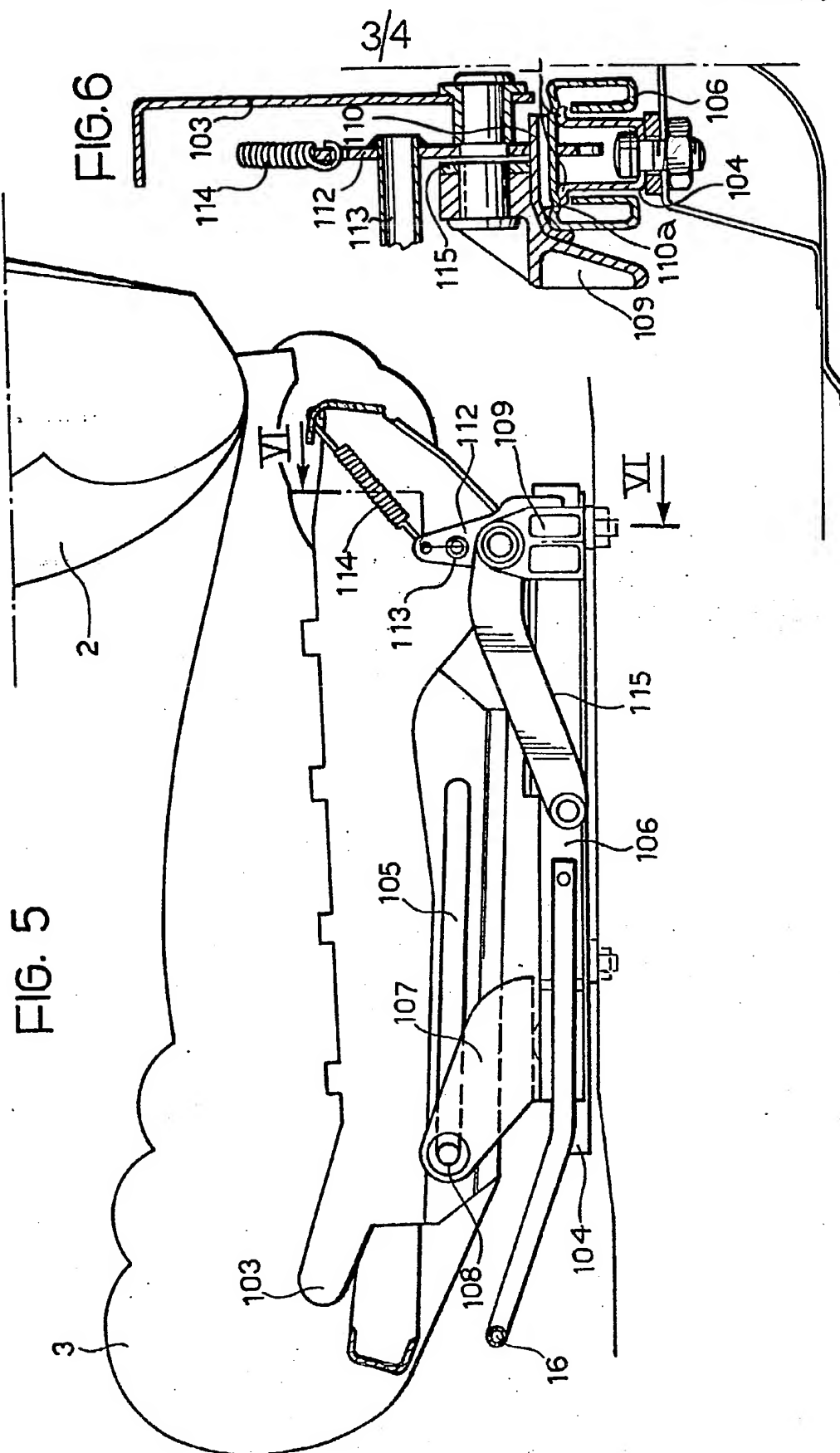
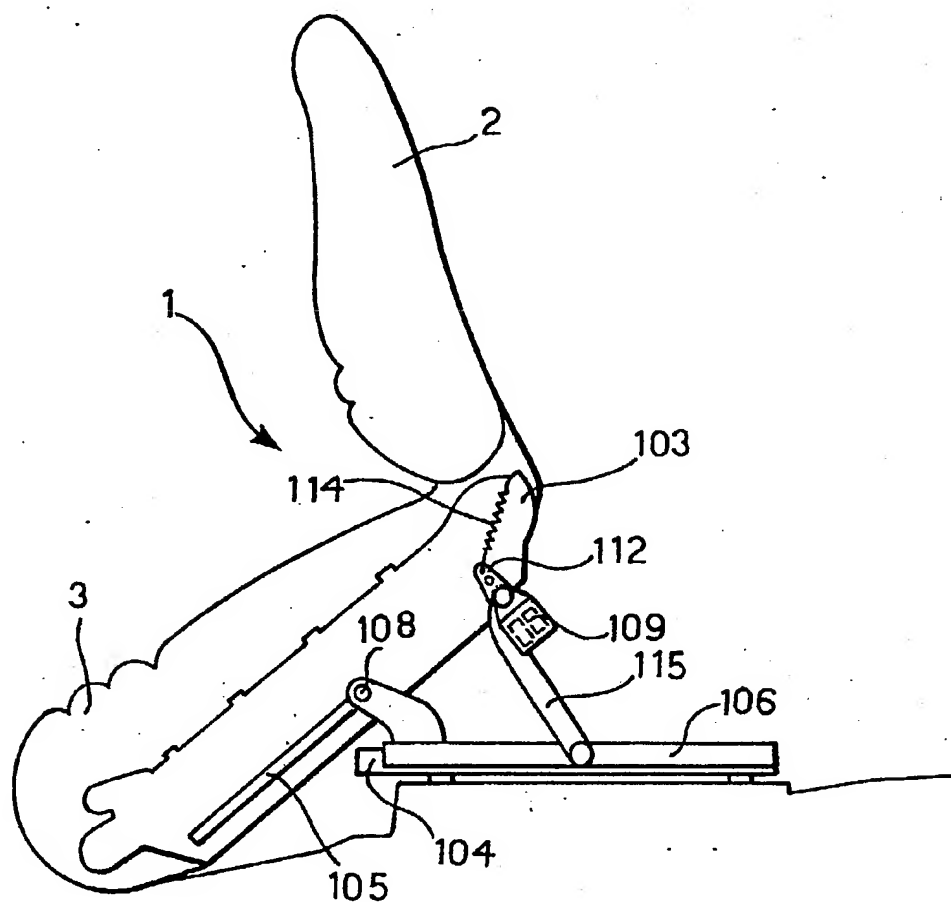




FIG. 7





European Patent  
Office

# EUROPEAN SEARCH REPORT

0120817

Application number

EP 84 83 0069

| DOCUMENTS CONSIDERED TO BE RELEVANT   |   |  |  |
|---|---|--|--|
| Category  | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim                              | CLASSIFICATION OF THE APPLICATION (Int. Cl. *) |
| A   | DE-A-2 032 147 (KARMANN)<br>* Whole document *                                | 1  | B 60 N 1/04                                    |
| A   | GB-A-2 099 691 (FAURE)<br>* Whole document *                                  | 1  |  |
| A   | FR-A-2 285 261 (RENAULT & PEUGEOT)<br>* Whole document *                      | 1  |  |
| A   | FR-A-2 373 255 (FARELLI)<br>* Whole document *                                | 1  |  |
| A   | FR-A-2 457 786 (TORTA)<br>* Whole document *                                  | 1  |  |
| A   | FR-A-2 459 740 (SESSA)<br>* Whole document *                                  | 1  | TECHNICAL FIELDS SEARCHED (Int. Cl. *)         |
| A   | US-A-2 005 112 (LE ROY)<br>* Whole document *                                 | 1  | B 60 N   |
| A   | US-A-2 321 716 (WAHLBERG)<br>* Whole document *                               | 1  |  |
| The present search report has been drawn up for all claims  |   |  |  |
| Place of search<br>THE HAGUE  |   | Date of completion of the search<br>02-07-1984 | Examiner<br>HEROUAN E.                         |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p> |   |  |  |

EPO Form 1503, 03.82